**Claims:**

1-23. (cancelled)

24. (new) A four-wheel-independent-steering-vehicle steering control method comprising:

(a) using one of variables of steering constraint condition equations for forming a prescribed steering mode as a steering command value S and changing the steering command value S from a value $S_1$ to a value $S_2$ ;

(b) computing incremental transition steering angles of four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+\Delta S}$ corresponding to a steering command value $(S_1+\Delta S)$, which is the steering command value $S_1$ to which an incremental steering command value $\Delta S$ has been added , in accordance with the steering constraint condition equations;

(c) changing steering angles of the four wheels $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ toward the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+\Delta S}$ ;

(d) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+\Delta S}$ ;

(e) computing next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+2\Delta S}$ corresponding to a steering command value $(S_1+2\Delta S)$ , in accordance with the steering constraint condition equations;

(f) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ toward the next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+2\Delta S}$ ;

(g) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+2\Delta S}$ ; and

(h) repeating above Steps (e)-(g) until the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ reach steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S2}$ corresponding to the steering command value $S_2$ .

25. (new) A four-wheel-independent-steering-vehicle steering control method comprising:

(a) using one of variables of steering constraint condition equations for forming a prescribed steering mode as a steering command value S and changing the steering command value S from a value $S_1$ to a value $S_2$;

(b) computing incremental transition steering angles of four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+\Delta S}$ and incremental transition speeds of rotation of the four wheels $[n_1, n_2, n_3, n_4]_{S1+\Delta S}$ corresponding to a steering command value $(S_1+\Delta S)$, which is the steering command value $S_1$ to which an incremental steering command value $\Delta S$ has been added, in accordance with the steering constraint condition equations;

(c) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and speeds of rotation $n_1, n_2, n_3, n_4$ toward the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+\Delta S}$ and the incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{S1+\Delta S}$, respectively;

(d) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+\Delta S}$;

(e) computing next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+2\Delta S}$ and next incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{S1+2\Delta S}$ corresponding to a steering command value $(S_1+2\Delta S)$, respectively, in accordance with the steering constraint condition equations ;

(f) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and the speeds of rotation $n_1, n_2, n_3, n_4$ toward the next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+2\Delta S}$ and the next incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{S1+2\Delta S}$, respectively ;

(g) detecting a steering angle conformance, wherein the steering angles of the four wheels $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles of the four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S1+2\Delta S}$ ; and

(h) repeating above Steps (e)-(g) until the steering angles of the four wheels $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ reach the steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{S2}$ corresponding to the steering command value $S_2$ .

26. (new) A four-wheel-independent-steering-vehicle steering control method comprising:

(a) using one of variables of steering constraint condition equations for forming a prescribed steering mode as a steering command value R which is a distance between a point central to positions of four wheels and a center point of concentric arcs, and changing the steering command value R from a value $R_1$ to a value $R_2$ ;

(b) computing incremental transition steering angles of the four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+\Delta R}$ corresponding to a steering command value $(R_1+\Delta R)$, which is the steering command value $R_1$ to which an incremental steering command value $\Delta R$ has been added , in accordance with the steering constraint condition equations ;

(c) changing the steering angles of the four wheels $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ toward the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+\Delta R}$ ;

(d) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+\Delta R}$ ;

(e) computing next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+2\Delta R}$ corresponding to a steering command value $(R_1+2\Delta R)$ , in accordance with the steering constraint condition equations ;

(f) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ toward the next incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+2\Delta R}$ ;

(g) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the next incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+2\Delta R}$ ; and

(h) repeating above Steps (e)-(g) until the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ reach the steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R2}$ corresponding to the steering command value $R_2$ .

27. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 26, wherein, when wherein turning-vehicle-travel-paths of the wheels are concentric arcs, the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = -\alpha_3 = \tan^{-1}\left(\frac{L}{R-W}\right)$$

$$\alpha_2 = -\alpha_4 = \tan^{-1}\left(\frac{L}{R+W}\right)$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels; and

R, which is used as the steering command value, is the distance between a point central to the positions of the four wheels and a center point of the concentric arcs.

28. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 26, wherein when turning-vehicle-travel-paths of the wheels are concentric arcs, the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = \tan^{-1}\left(\frac{2L}{R-W}\right)$$

$$\alpha_2 = \tan^{-1}\left(\frac{2L}{R+W}\right)$$

$$\alpha_3 = \alpha_4 = 0$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels; and

R, which is used as the steering command value, is the distance between a point central to the positions of the four wheels and a center point of the concentric arcs.

29. (new) A four-wheel-independent-steering-vehicle steering control method comprising:

(a) using one of variables of steering constraint condition equations for forming a prescribed steering mode as a steering command value R which is a distance between a point central to positions of four wheels and a center point of concentric arcs, and changing the steering command value R from a value $R_1$ to a value $R_2$ ;

(b) computing incremental transition steering angles of the four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+\Delta R}$ and incremental transition speeds of rotation of the four wheels$[n_1, n_2, n_3, n_4]_{R1+\Delta R}$ corresponding to a steering command value $(R_1+\Delta R)$, which is the steering command value $R_1$ to which an incremental steering command value $\Delta R$ has been added, in accordance with the steering constraint condition equations ;

(c) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and speeds of rotation $n_1, n_2, n_3, n_4$ toward the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+\Delta R}$ and the incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{R1+\Delta R}$, respectively ;

(d) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+\Delta R}$ ;

(e) computing next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+2\Delta R}$ and next incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{R1+2\Delta R}$ corresponding to a steering command value ($R_1$+2ΔR), respectively, in accordance with the steering constraint condition equations ;

(f) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and the speeds of rotation $n_1, n_2, n_3, n_4$ toward next incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+2\Delta R}$ and next incremental transition speeds of rotation$[n_1, n_2, n_3, n_4]_{R1+2\Delta R}$, respectively ;

(g) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R1+2\Delta R}$ ; and

(h) repeating above Steps (e)-(g) until the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ reach the steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{R2}$ corresponding to the steering command value $R_2$ .

30. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 29, wherein when turning-vehicle-travel-paths of the wheels are concentric arcs, the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = -\alpha_3 = \tan^{-1}\left(\frac{L}{R-W}\right)$$

$$\alpha_2 = -\alpha_4 = \tan^{-1}\left(\frac{L}{R+W}\right)$$

$$n_1 : n_2 : n_3 : n_4 = \sqrt{(R-W)^2 + L^2} : \sqrt{(R+W)^2 + L^2}$$
$$: \sqrt{(R-W)^2 + L^2} : \sqrt{(R+W)^2 + L^2}$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

n1, n2, n3, and n4 are the speeds of rotation of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels; and

R, which is used as the command value, is the distance between a point central to the positions of the four wheels and a center point of the concentric arcs.

31. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 29, wherein when turning-vehicle-travel-paths of the wheels are concentric arcs, the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = \tan^{-1}\left(\frac{2L}{R-W}\right)$$

$$\alpha_2 = \tan^{-1}\left(\frac{2L}{R+W}\right)$$

$\alpha_3 = \alpha_4 = 0$

$$n_1 : n_2 : n_3 : n_4 = \sqrt{(R-W)^2 + (2L)^2} : \sqrt{(R+W)^2 + (2L)^2} : |R-W| : |R+W|$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

n1, n2, n3, and n4 are the speeds of rotation of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels; and

R, which is used as the command value, is the distance between a point central to the positions of the four wheels and a center point of the concentric arcs.

32. (new) A four-wheel-independent-steering-vehicle steering control method comprising:

(a) using one of variables of steering constraint condition equations for forming a prescribed steering mode as a steering command value $\alpha_n$ which is an angle formed between a center line Y between left and right wheels of the vehicle, and a direction of travel of a point $P_n$, and changing the steering command value $\alpha_n$ from a value $\alpha_{n1}$ to a value $\alpha_{n2}$;

(b) computing incremental transition steering angles of the four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+\Delta\alpha n}$ corresponding to a steering command value $(\alpha_{n1}+\Delta\alpha_n)$, which is the steering command value $\alpha_{n1}$ to which an incremental steering command value $\Delta\alpha_n$ has been added, in accordance with the steering constraint condition equations ;

(c) changing the steering angles of the four wheels $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ toward the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+\Delta\alpha n}$;

(d) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+\Delta\alpha n}$ ;

(e) computing next incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+2\Delta\alpha n}$ corresponding to a steering command value $(\alpha_{n1}+2\Delta\alpha_n)$ in accordance with the steering constraint condition equations ;

(f) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ toward the next incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+2\Delta\alpha n}$ ;

(g) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the next incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+2\Delta\alpha n}$ ; and

(h) repeating above Steps (e)-(g) until the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ each the steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n2}$ corresponding to the steering command value $\alpha_{n2}$.

33. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 32, wherein the steering constraint condition equations for forming a prescribed steering mode are

$$\alpha_1 = -\alpha_3 = \tan^{-1}\left(\frac{L}{x_n + \frac{y_n}{\tan\alpha_n} - W}\right)$$

and

$$\alpha_2 = -\alpha_4 = \tan^{-1}\left(\frac{L}{x_n + \frac{y_n}{\tan\alpha_n} + W}\right)$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels;

$x_n$ and $y_n$ are the x and y coordinates of an arbitrary point on the vehicle, $P_n$; and

$\alpha_n$, which is used as the steering command value, is the angle formed between the center line Y between the left and right wheels of the vehicle, and the direction of travel of the point $P_n$.

34. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 32, wherein the steering constraint condition equations for forming a prescribed steering mode are

$$\alpha_1 = \tan^{-1}\left(\frac{2L}{x_n + \frac{L + y_n}{\tan\alpha_n} - W}\right)$$

$$\alpha_2 = \tan^{-1}\left(\frac{2L}{x_n + \frac{L + y_n}{\tan\alpha_n} + W}\right)$$

and

$$\alpha_3 = \alpha_4 = 0$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels;

$x_n$ and $y_n$ are the x and y coordinates of an arbitrary point on the vehicle, $P_n$; and

$\alpha_n$, which is used as the steering command value, is the angle formed between the center line Y between the left and right wheels of the vehicle, and the direction of travel of the point $P_n$.

35. (new) A four-wheel-independent-steering-vehicle steering control method comprising:

(a) using one of variables of steering constraint condition equations for forming a prescribed steering mode as a steering command value $\alpha_n$ which is an angle formed between a center line Y between left and right wheels of the vehicle, and a direction of travel of the point $P_n$, and changing the steering command value $\alpha_n$ from a value $\alpha_{n1}$ to a value $\alpha_{n2}$;

(b) computing incremental transition steering angles of four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+\Delta\alpha}$ and incremental transition speeds of rotation of the four wheels $[n_1, n_2, n_3, n_4]_{\alpha n1+\Delta\alpha}$ corresponding to a steering command value $(\alpha_{n1}+\Delta\alpha_n)$, which is the steering command

value $\alpha_{n1}$ to which an incremental steering command value $\Delta\alpha_n$ has been added, in accordance with the steering constraint condition equations;

(c) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and speeds of rotation $n_1, n_2, n_3, n_4$ toward the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+\Delta\alpha n}$ and the incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{\alpha n1+\Delta\alpha n}$, respectively ;

(d) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+\Delta\alpha n}$ ;

(e) computing next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+2\Delta\alpha n}$ and next incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{\alpha n1+2\Delta\alpha n}$ corresponding to a steering command value $(\alpha_{n1}+2\Delta\alpha_n)$, respectively, in accordance with the steering constraint condition equations ;

(f) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and the speeds of rotation $n_1, n_2, n_3, n_4$ toward the next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+2\Delta\alpha n}$ and the next incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{\alpha n1+2\Delta\alpha n}$, respectively ;

(g) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n1+2\Delta\alpha n}$ ; and

(h) repeating above Steps (e)-(g) until the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ reach the steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha n2}$ corresponding to the steering command value $\alpha_{n2}$.

36. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 35, wherein the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = -\alpha_3 = \tan^{-1}\left(\frac{L}{x_n + \frac{y_n}{\tan\alpha_n} - W}\right)$$

$$\alpha_2 = -\alpha_4 = \tan^{-1}\left(\frac{L}{x_n + \frac{y_n}{\tan\alpha_n} + W}\right)$$

and

$$n_1 : n_2 : n_3 : n_4 = \sqrt{\left(x_n + \frac{y_n}{\tan\alpha_n} - W\right)^2 + L^2} : \sqrt{\left(x_n + \frac{y_n}{\tan\alpha_n} + W\right)^2 + L^2}$$
$$: \sqrt{\left(x_n + \frac{y_n}{\tan\alpha_n} - W\right)^2 + L^2} : \sqrt{\left(x_n + \frac{y_n}{\tan\alpha_n} + W\right)^2 + L^2}$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

n1, n2, n3 and n4 are the speeds of rotation of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels;

$x_n$ and $y_n$ are the x and y coordinates of an arbitrary point on the vehicle, $P_n$; and $\alpha_n$, which is used as the steering command value, is the angle formed between the center line Y between the left and right wheels of the vehicle and the direction of travel of the point $P_n$.

37. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 35, wherein the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = \tan^{-1}\left(\frac{2L}{x_n + \frac{L + y_n}{\tan\alpha_n} - W}\right)$$

$$\alpha_2 = \tan^{-1}\left(\frac{2L}{x_n + \frac{L + y_n}{\tan\alpha_n} + W}\right)$$

$\alpha_3 = \alpha_4 = 0$

and

$$n_1 : n_2 : n_3 : n_4 = \sqrt{\left(x_n + \frac{L + y_n}{\tan\alpha_n} - W\right)^2 + (2L)^2} : \sqrt{\left(x_n + \frac{L + y_n}{\tan\alpha_n} + W\right)^2 + (2L)^2}$$
$$: \left|x_n + \frac{L + y_n}{\tan\alpha_n} - W\right| : \left|x_n + \frac{L + y_n}{\tan\alpha_n} + W\right|$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

n1, n2, n3 and n4 are the speeds of rotation of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels;

$x_n$ and $y_n$ are the x and y coordinates of an arbitrary point on the vehicle, $P_n$; and $\alpha_n$, which is used as the steering command value, is the angle formed between the center line Y between the left and right wheels of the vehicle and the direction of travel of the point $P_n$.

38. (new) A four-wheel-independent-steering-vehicle steering control method comprising:

(a) using one of variables of steering constraint condition equations for forming a prescribed steering mode as a steering command value $\alpha_0$ which is an angle formed between a center line Y between left and right wheels of the vehicle, and a direction of travel of a point $P_0$, which is a center point on a line connecting left and right front wheels, and changing the steering command value $\alpha_0$ from a value $\alpha_{01}$ to a value $\alpha_{02}$;

(b) computing incremental transition steering angles of the four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+\Delta\alpha 0}$ corresponding to a steering command value ($\alpha_{01}+\Delta\alpha_0$), which is the steering command value $\alpha_{01}$ to which an incremental steering command value $\Delta\alpha_0$ has been added, in accordance with the steering constraint condition equations ;

(c) changing the steering angles of the four wheels $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ toward the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+\Delta\alpha 0}$ ;

(d) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+\Delta\alpha n}$ ;

(e) computing next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+2\Delta\alpha 0}$ corresponding to a steering command value ($\alpha_{01}+2\Delta\alpha_0$) in accordance with the steering constraint condition equations ;

(f) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ toward the next incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+2\Delta\alpha 0}$ ;

(g) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the next incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+2\Delta\alpha 0}$ ; and

(h) repeating above Steps (e)-(g) until the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ reach the steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 02}$ corresponding to the steering command value $\alpha_{02}$.

39. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 38, wherein the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = -\alpha_3 = \tan^{-1}\left(\frac{1}{\frac{1}{\tan\alpha_0} - \frac{W}{L}}\right)$$

$$\alpha_2 = -\alpha_4 = \tan^{-1}\left(\frac{1}{\frac{1}{\tan\alpha_0} + \frac{W}{L}}\right)$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels; and

$\alpha_o$, which is used as the steering command value, is the angle formed between the center line Y between the left and right wheels of the vehicle, and the direction of travel of the point Po, which is the center point on a line connecting the left and right front wheels.

40. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 38, wherein the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = \tan^{-1}\left(\frac{1}{\frac{1}{\tan\alpha_0} - \frac{W}{2L}}\right)$$

$$\alpha_2 = \tan^{-1}\left(\frac{1}{\frac{1}{\tan\alpha_0} + \frac{W}{2L}}\right)$$

and

$\alpha_3 = \alpha_4 = 0$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels; and

$\alpha_o$, which is used as the steering command value, is the angle formed between the center line Y between the left and right wheels of the vehicle, and the direction of travel of the point Po, which is the center point on a line connecting the left and right front wheels.

41. (new) A four-wheel-independent-steering-vehicle steering control method comprising:

(a) using one of variables of steering constraint condition equations for forming a prescribed steering mode as a steering command value $\alpha_0$ which is an angle formed between a center line Y between left and right wheels of the vehicle, and a direction of travel of a point $P_0$, which is a center point on a line connecting left and right front wheels, and changing the steering command value $\alpha_0$ from a value $\alpha_{01}$ to a value $\alpha_{02}$ ;

(b) computing incremental transition steering angles of the four wheels $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+\Delta\alpha 01}$ and incremental transition speeds of rotation of the four wheels $[n_1, n_2, n_3, n_4]_{\alpha 01+\Delta\alpha 01}$ corresponding to a steering command value $(\alpha_{01}+\Delta\alpha_0)$, which is the steering command value $\alpha_{01}$ to which an incremental steering command value $\Delta\alpha_0$ has been added, in accordance with the steering constraint condition equations ;

(c) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and speeds of rotation $n_1, n_2, n_3, n_4$ toward the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+\Delta\alpha 0}$ and the incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{\alpha 01+\Delta\alpha 0}$, respectively;

(d) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+\Delta\alpha 0}$;

(e) computing next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+2\Delta\alpha 0}$ and next incremental transition speeds of rotation $[n_1, n_2, n_3, n_4]_{\alpha 01+2\Delta\alpha n}$ corresponding to a steering command value $(\alpha_{01}+2\Delta\alpha_0)$, respectively, in accordance with the steering constraint condition equations;

(f) changing the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and the speeds of rotation $n_1, n_2, n_3, n_4$ toward the next incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+2\Delta\alpha 0}$ and the next incremental transition speeds of rotation$[n_1, n_2, n_3, n_4]_{\alpha 01+2\Delta\alpha 0}$, respectively;

(g) detecting a steering angle conformance, wherein the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ have reached the incremental transition steering angles $[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{\alpha 01+2\Delta\alpha 0}$; and

(h) repeating above Steps (e)-(g) until the steering angles $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ reach the steering angles$[\alpha_1, \alpha_2, \alpha_3, \alpha_4]_{a02}$ corresponding to the steering command value $\alpha_{0\,2}$ .

42. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 41, wherein the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = -\alpha_3 = \tan^{-1}\left(\frac{1}{\frac{1}{\tan\alpha_0} - \frac{W}{L}}\right)$$

$$\alpha_2 = -\alpha_4 = \tan^{-1}\left(\frac{1}{\frac{1}{\tan\alpha_0} + \frac{W}{L}}\right)$$

and

$$n_1 : n_2 : n_3 : n_4 = \sqrt{\left(\frac{L}{\tan\alpha_0} - W\right)^2 + L^2} : \sqrt{\left(\frac{L}{\tan\alpha_0} + W\right)^2 + L^2}$$
$$: \sqrt{\left(\frac{L}{\tan\alpha_0} - W\right)^2 + L^2} : \sqrt{\left(\frac{L}{\tan\alpha_0} + W\right)^2 + L^2}$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

n1, n2, n3, and n4 are the speeds of rotation of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels; and

$\alpha_o$, which is used as the steering command value, is the angle formed between the center line Y between the left and right wheels of the vehicle, and the direction of travel of the point Po, which is the center point on a line connecting the left and right front wheels.

43. (new) A four-wheel-independent-steering-vehicle steering control method as recited in claim 41, wherein the steering constraint condition equations for forming the prescribed steering mode are

$$\alpha_1 = \tan^{-1}\left(\frac{1}{\frac{1}{\tan\alpha_0} - \frac{W}{2L}}\right)$$

$$\alpha_2 = \tan^{-1}\left(\frac{1}{\frac{1}{\tan\alpha_0} + \frac{W}{2L}}\right)$$

$\alpha_3 = \alpha_4 = 0$

and

$$n_1 : n_2 : n_3 : n_4 = \sqrt{\left(\frac{2L}{\tan\alpha_0} - W\right)^2 + (2L)^2} : \sqrt{\left(\frac{2L}{\tan\alpha_0} + W\right)^2 + (2L)^2} : \left|\frac{2L}{\tan\alpha_0} - W\right| : \left|\frac{2L}{\tan\alpha_0} + W\right|$$

where

$\alpha_1$, $\alpha_2$, $\alpha_3$, and $\alpha_4$ are the steering angles of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

n1, n2, n3, and n4 are the speeds of rotation of the right front wheel, left front wheel, right rear wheel, and left rear wheel, respectively;

L is the distance between each wheel and a center line X between the front wheels and rear wheels;

W is the distance between each wheel and a center line Y between the left wheels and right wheels; and

$\alpha_o$, which is used as the steering command value, is the angle formed between the center line Y between the left and right wheels of the vehicle, and the direction of travel of the point Po, which is the center point on a line connecting the left and right front wheels.